MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2022/2023

DOM5014 – OPERATIONS MANAGEMENT

(All sections/Groups)

08 JULY 2023
9.00 a.m – 11.00 a.m
(2 Hours)

INSTRUCTIONS TO STUDENT

1. This question paper consists of 11 pages with 2 sections.

2. Attempt **ALL** questions in Section A and Section B. The distribution of the marks for each question is given.

3. Please write all your answers for Section A on the OMR form provided and all answers for Section B in the Answer Booklet provided.

SECTION A: Multiple Choice Questions (20 Marks)

1. Which of the following are the elements in the management functions?
   A. Accounting, Finance, Marketing, Operations, and Management.
   B. Organise, Plan, Control, Staff, and Manage.
   C. Plan, Organise, Staff, Lead, and Control.
   D. Plan, Lead, Organise, Manage, and Control.

2. Which of the following is **NOT** one of the critical decisions of Operations Management (OM)?
   A. Layout strategy.
   B. Maintenance.
   C. Mass customisation.
   D. Supply-chain management.

3. Which is **INCORRECT** regarding differences between goods and services?
   A. Tangible goods are generally produced and consumed immediately; services are not.
   B. Most goods are common to many customers; services are often unique to the final customer.
   C. Usually, most of the goods are capital intensive compared to services.
   D. Services tend to have higher customer interaction than goods.

4. The Orient Foundry company produces circular utility access hatches (manhole covers). In their production line, James and his 3 friends able to produce 160 covers in a 10-hour shift. What will be their productivity?
   A. 16 covers/labor-hour.
   B. 40 covers/labor-hour.
   C. 3 covers/labor-hour.
   D. 4 covers/labor-hour.

5. The Flowserve VELAN is producing cast bronze valves on an assembly line. Currently, they are producing 1600 valves each 8-hour shift. What would it be if the productivity is increased by 10%?
   A. 180 valves/hour.
   B. 200 valves/hour.
   C. 220 valves/hour.
   D. 880 valves/hour.

Continued ...

6. Which of the following are the productivity variables that are commonly used?
   A. Labor, Capital, and Management.
   B. Technology, Raw materials, and Labor.
   C. Efficiency, Cost, and Overhead.
   D. Quality, Efficiency, and Cost

7. _____ is the set of activities that transforms inputs into goods and services.
   A. Service production
   B. Operations management
   C. Productivity
   D. Processing management

8. The Pacdora Box plant produces wooden packing boxes to be used in the local seafood industry. The firm operations allow the company to make 600 boxes per day, in two 8-hour shifts (300 boxes per shift). What is the firm's labor productivity?
   A. 37.5 boxes/hour.
   B. 75 boxes/hour.
   C. 0.25 boxes/hour.
   D. 0.13 boxes/hour.

9. Which of the following is **NOT** in the service sector?
   A. Ng Dental Clinic.
   B. Public Bank Berhad.
   C. Samsung Malaysia Sdn. Bhd.
   D. Creative Hair Studio and Academy.

10. Which of the following will **NOT** be an operations activity of Malaysia Airlines Berhad?
   A. Flying schedules.
   B. Promote inflight services.
   C. Repair traffic lights.
   D. Aircraft maintenances.

11. Which of the following is **NOT** one of the four main types of inventory?
   A. Raw material inventory.
   B. Work-in-process inventory.
   C. Maintenance/Repair/Operating supply inventory.
   D. Safety stock inventory.

Continued ...

12. ABC analysis divides on-hand inventory into three classes based on _____.
    A. unit price
    B. item quality
    C. annual dollar volume
    D. number units on hand

13. _____ is a cost to prepare a machine or process for manufacturing an order.
    A. Setup cost
    B. Holding cost
    C. Ordering cost
    D. Machinery cost

14. Which of the following is **CORRECT** about "Work-in-process (WIP)"?
    A. Purchased but not processed.
    B. A function of cycle time for a product.
    C. Completed product awaiting shipment.
    D. Keep machinery and processes productive

15. Below are the advantages of cycle counting **EXCEPT** _____ .
    A. eliminates shutdowns and interruptions
    B. eliminates annual inventory adjustment
    C. maintains semi accurate inventory records
    D. trained personnel audit inventory accuracy

16. Cycle counting _____.
    A. provides a measure of inventory turnover
    B. provides a measure of inventory accuracy
    C. is a process by which inventory records are verified once a year
    D. assumes that all inventory records must be verified with the same frequency

17. There are two types of inventory models, namely _____ demand and _____ demand.

    A. quantity; quality
    B. individual; group
    C. quality; finished goods
    D. independent; dependent

Continued ...

18. _____ inventory is material that is usually purchased, but has yet to enter the manufacturing process.
A. Decoupling
B. Raw material
C. Safety stock
D. Supply

19. Which of the following are the functions of inventory?
I. To decouple or separate various parts of the production process.
II. To take advantage of quantity discounts.
III. To keep machinery and processes productive.
IV. To hedge against inflation.
A. I, II, and III.
B. I, II, and IV.
C. I, III, and IV.
D. II, III, and IV.

20. _____ help to track receipts and subtractions on a continuing basis.
A. Periodic systems
B. Record accuracy
C. Perpetual inventory
D. Cycle counting

[Total: 20 marks]

SECTION B: Structured Questions (80 Marks)
QUESTION 1

Ice cream perfection from cow to cone

Ben & Jerry's is a Burlington, Vermont-based corporation, and a wholly-owned subsidiary of Unilever. The company produces a wide variety of super-premium ice cream and ice cream novelties, using high-quality ingredients including milk and cream from family farmers who do not treat their cows with the synthetic hormone rBGH, eggs from hens on Certified Humane cage-free farms, and brownies from Greyston Bakery, a social enterprise in Yonkers, New York.

Ben & Jerry's maintains the strictest standards of product quality to ensure its customers get the full flavour experience each time they enjoy a pint or cone of Vermont's finest ice cream. This attention to detail can be seen from "cow to cone," as the company says, meaning that each step of its supply chain – from suppliers and distributors to manufacturing operations – must comply with the company's three-part mission statement, which emphasizes product quality, economic reward, and a commitment to the community.

Focusing on its manufacturing operations, Ben & Jerry's maintains quality procedures for key performance indicators (KPIs) that ensure consistent product quality for every pint produced. To track quantitative data, the ice cream manufacturer had previously been using a paper-based system, which was proving to be cumbersome for operators and data administrators alike. Operators would take individual readings and calculate an average of those readings to plot on a paper chart. Quality assurance personnel would then perform manual calculations to compute trends and create reports.

This system was not only slow and inflexible, but also costly in terms of man hours required for calculation and analysis. Ben & Jerry's needed a fast and reliable way to collect and analyze the vital quality data of its super-premium ice cream products. "What sets Ben & Jerry's apart from our competitors is not only our insistence on high-quality ingredients, but also the extra and unique flavours we use to create a euphoric customer experience. Ensuring the final product reflects the passion and quality that we put into each pint required a quality solution that emphasized the same attention to details that we do." said Melissa Corcia, Quality Manager, Ben & Jerry's. The solution Ben & Jerry's decided to deploy the InfinityQS ProFicient enterprise quality hub to streamline its quality control procedures.

Powered by a Statistical Process Control (SPC) analysis engine, the system easily automates data collection and integration from terminals on the shop floor, while its real-time monitoring and analysis functions enable the quality department to acquire Manufacturing Intelligence by tracking variability across each production line. Because each line has a different run capability, Ben & Jerry's created run charts within ProFicient based on Six Sigma data collected on the plant floor to determine variations specific to each individual line.

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By measuring, monitoring, and controlling four main product attributes—weight, volume, air addition, and inclusion amounts— as the pints come off the production lines, quality teams can work with production to quickly make adjustment in real time as products or processes approach specification limits. Quality teams can also compare the data acquired through visual cut-ups—a process where a pint is cut into quadrants to ensure the proper amount of inclusions appear in each serving—to the run capability data in ProFicient to identify the source of any variability in inclusion or variegate distribution and volume as identified during the cut-up.

Since implementing InfinityQS ProFicient, Ben & Jerry's has used Manufacturing Intelligence to identify instances to improve run capability and raw material usage. Because high quality ingredients are typically high priced (up to $800 for a single barrel of swirl), the ability to fine tune processes with more precise specification limits results in less raw material variation, increased cost savings, and a higher quality product for the consumer. Furthermore, with ProFicient's advanced reporting suite, the ice cream manufacturer is saving a significant amount of time by eliminating manual calculations and time-consuming report creation. Reports now run in seconds as opposed to the eight to 10 hours that quality assurance personnel previously spent calculating data. Operators have dramatically reduced paper usage and can better focus on improving production processes and efficiency.

Source adapted from: InfinityQS (2021) Ben & Jerry\'s, InfinityQS, Available at: https://www.infinityqs.com/resources/case-studies/ben-jerry-s (Accessed: April 10, 2023).

Continued ...

Answer the following questions based on the article above:

(a) Based on the case study above, discuss the main way that Ben & Jerry's use to maintain their product's quality. (2 marks)

(b) Apart from your answer in Question 1(a), what are the other **TWO (2)** ways that Ben & Jerry's applied to ensure their product's quality are up to their benchmark? (4 marks)

(c) Identify **FIVE (5)** implications of InfinityQS ProFicient system towards Ben & Jerry's whole production process. (5 marks)

(d) ***".....as the company says, meaning that each step of its supply chain – from suppliers and distributors to manufacturing operations – must comply with the company's three-part mission statement, which emphasizes product quality, economic reward, and a commitment to the community."***

Based on this statement, it is very important of having a good coordination in all supply chain activities. Thus, identify the **FOUR (4)** strategic importance of supply chain. (4 marks)

[Total: 15 marks]

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QUESTION 2

(a) Bintang Cahaya Enterprise, owned by Mr. Firdaus, is a consultant company based in Kuala Lumpur and has been operating for about 10 years. Mr. Firdaus is planning to open up a new branch in Northern region, either in Perak or Pulau Pinang. Thus, he needs to find out the best location strategy to speed up his company's growth.

i. Identify any **FOUR (4)** factors that need to be considered by Mr. Firdaus before he makes ideal location decisions. (4 marks)

ii. Identify any **THREE (3)** reasons why location is crucial for organisations. (3 marks)

(b) The following Table 1 gives the number of pints of type B blood used at Oriental Melaka Straits Medical Centre in the past 6 weeks:

WEEK OF	PINTS USED
August 31	360
September 7	389
September 14	410
September 21	381
September 28	368
October 5	374

Table 1

Based on the data given:

(State your answer in TWO (2) decimal points)

i. Forecast the demand for the week of October 12 using a 3-week moving average. (4 marks)

ii. Forecast the demand for the week of October 12 using a 3-week weighted moving average, with weights of .1, .3, and .6; by applying .6 to the most recent week. (4 marks)

[Total: 15 marks]

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QUESTION 3

(a) Truetone Colour Technology produces short runs of photocopy machines that are transported to distributors. In order to reduce inventory, Mr. Alex try to introduce a kanban system to his workers. The following Table 2 have been provided:-

Daily demand	650 units
Production lead time	½ day
Safety stock	¼ day
Kanban size	60 units

Table 2

i. Based the data given, calculate how many kanbans are needed in the process. (7.5 marks)

(State your answer in TWO (2) decimal points)

ii. Define *"Kanban"*. (1.5 marks)

(b) Toyota engineer Taiichi Ohno came up with seven categories of waste. Briefly explain any **THREE (3)** categories of Ohno's waste. (6 marks)

[Total: 15 marks]

Continued ...

QUESTION 4

(a) Briefly explain any **THREE (3)** techniques that can be applied for improving service productivity. Provide **ONE (1)** example for each strategy. (9 marks)

(b) Oklahoma State University's business program has the facilities and faculty to handle an enrollment of 2,000 new students per semester. However, in an effort to limit class sizes to a reasonable level, they placed a ceiling on enrollment of 1,500 new students. Although there was ample demand for business course last semester, conflicting schedules allowed only 1,450 new students to take business courses.

i. Calculate the utilisation rate for the students enrollment. (2 marks)

ii. Calculate the efficiency rate for the student's enrollment. (2 marks)

(c) If a production plant has an effective capacity of 6,500 units per day and its efficiency is 88%, what would be the actual (planned) output? (2 marks)

[Total: 15 marks]

QUESTION 5

(a) What is the objective of having human resource strategy? (2 marks)

b) Briefly describe **FOUR (4)** work schedules that can be adopted by many organisation. (8 marks)

[Total: 10 marks]

Continued ...

QUESTION 6

(a) A facility layout is the process by which the placement of departments, workgroups within departments, workstations and machines within a facility is determined. Therefore, briefly describe any **THREE (3)** types of layout that organisation can apply to their facility areas. (6 marks)

(b) List any **FOUR (4)** helpful ideas for supermarket layout. (4 marks)

[Total: 10 marks]

End of paper